Research Article

Vision
25(1) 47–64, 2021

DOI: 10.1177/0972262920988805
journals.sagepub.com/home/vis

Examining the Interconnections Between Sustainable Logistics Practices, Environmental Reputation and Financial Performance: A Mediation Approach

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Abstract

As environmental awareness and the patronage of logistics services grow, there is a growing demand for the logistics sector to provide more sustainable environmental services, and although the logistics sector performs functions such as reverse logistics, packaging, inventory management, transportation, warehousing, waste management, distribution, etc., which are very core to economic growth, they also significantly contribute to greenhouse effect and consume huge amounts of resources. This study, drawing on the institutional theory and the natural resource-based view, explores the framework through which sustainable logistics practices such as sustainable transportation, reverse logistics and management of waste, sustainable packaging and distribution, green monitoring and evaluation, and sustainable information sharing influence environmental reputation and financial performance. The study adopted partial least square structural equation modelling technique in analysing data due to it having more statistical power. The findings of the study showed that sustainable logistics practices had enormous influence on environmental reputation and financial performance. In terms of mediation, environmental reputation had no mediation effect between waste management and financial performance but partially mediated the relationships between sustainable transportation, sustainable information sharing and financial performance, while fully mediating the relationships between reverse logistics, sustainable packaging and distribution, green monitoring and evaluation, and financial performance. This study concentrated on the logistics sector; thus, this study results will provide vital data to both scholars and practitioners in comprehending the call and need to integrate sustainable policies and strategies into business and industrial operations to ensure environmental preservation.

Key Words

Sustainable Logistics Practices, Environmental Reputation, Financial Performance

Introduction

Logistics practices over the years have come under scrutiny mainly due to their enormous impact on the environment. These impacts significantly affect the environment as well as human existence, thereby making environmental awareness creation very vital to economic growth and reform (Baah et al., 2020). Logistics companies perform functions such as reverse logistics, packaging, inventory management, transportation, warehousing, waste management, distribution, etc., and as such contribute enormously to economic growth. According to Agyabeng-Mensah et al. (2020) the impacts of green logistics management practices have become crucial and an interesting issue globally. The rapid rise of sustainability issues has resulted in diverse stakeholders raising critical concerns in relation to firm practices, especially those in manufacturing and logistics sectors. Stakeholder pressures and scrutiny in these sectors are critical due to the enormous negative impacts of these sectors on the environment. Specifically, Ghana as a country has seen

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an increase in logistics and manufacturing activities mainly due to the rise in trade, new distribution centres, warehouses, logistics facilities, etc. According to the Organisation for Economic Co-operation and Development (OECD, 2010), Ghana ranks 70th when it comes to largest export economies in the world, and in 2017, Ghana's total exports and imports were US$17.1 billion and US$13.2 billion, respectively. These figures are expected to increase, and therefore, the many negative environmental impacts associated with logistics practices such as air pollution, greenhouse effect, resource and energy issues and ozone layer depletion, among others, have strengthened the scrutiny of logistics practices by various stakeholder groups (Baah & Jin, 2019). These scrutinies and pressures from stakeholders have to a larger extent motivated both logistics and manufacturing firms to adopt practices that are considered sustainable and ensure cleaner production practices (Baah et al., 2020; Chhabra et al., 2017; Gupta et al., 2018).

Importantly, sustainability needs to be understood as well as integrated in business operations because as international trade continues to increase, there is the need to assess the environmental aspects of transport and logistics, seeing that goods are and will continue to be moved over greater distances. According to Baah et al. (2020) and Agyabeng-Mensah et al. (2020), several studies have focused on the manufacturing sector, leaving out the logistics sector. This study is based on the rising nature of logistics activities and operations and focuses on the logistics sector in an effort to provide awareness and empirical evidence on sustainable logistics practices. Although green initiatives have been promoted by several stakeholders (Bag, 2017; González-Benito & González-Benito, 2006), less studies have sought to elaborate on how adopting green practices or initiatives boost a firm's environmental reputation and its financial performance in the context of an emerging economy and from the perspectives of logistics firms. This study specifically seeks to contribute to literature by exposing how sustainable logistics practices such as sustainable transportation, reverse logistics, waste management, sustainable packaging and distribution, green monitoring and evaluation, and sustainable information sharing affect a logistics company's environmental reputation and financial performance. In addition, the introduction of sustainable standards such as ISO 14001 in 1996 have promoted the formulation of corporate sustainability strategies that seek to preserve the environment (Fernando, 2017). Such standards coupled with other legislations from regulatory bodies have coerced companies to comply with environmental standards if they expect to operate smoothly without legal sanctions from diverse stakeholders (Baah et al., 2020).

Sustainable logistics practices capture the ability to conserve resources, minimize waste and enhance operational efficiency through eliminating wasteful processes in carrying out operations (Chhabra et al., 2017). These sustainable practices are very costly to implement and, as such, are likely to significantly influence the financial capacity of firms that implement green initiatives. According to Agyabeng-Mensah et al. (2020), accepting sustainable logistics management practices to some researchers initially limits the financial capacity of an organization, but improves environmental reputation, which eventually translates into market share and increased sales. Shashi et al. (2019) further explained that although green practices drain finances mostly in the implementation stage, it significantly boosts financial performance in the long run. Thus, the study seeks to assess the influence of sustainable logistics practices on environmental reputation and financial performance, as well as how environmental reputation mediates the relationships between the adopted sustainable logistics practices and financial performance. Additionally, the study aims to contribute to existing literature from the perspective of a developing country seeing that majority of past studies were conducted in developed countries. Again, extant literature on sustainability focused on manufacturing sectors; hence, this study is among the few that centres on the logistics sector, which is also known for its negative impacts on the environment.

This article is organized as follows: The first section of this article captures introduction. The second section captures empirical review and hypothesis development, while the third section discusses the study methodology. The fourth section discusses results, while the fifth section captures conclusion, implications and, finally, the sixth section discusses limitations and further research.

Empirical Review and Hypothesis Development

Theoretical Background

The growing demand for sustainable business practices that lead to a protected and preserved environment have motivated the wide adoption of environmental or green practices in both developed and developing countries. Specifically, the main question that diverse scholars seem to be interested in is 'what motivates the adoption of sustainable practices?' (Baah et al., 2020; Tsinopoulos et al., 2018). To respond to this question, the institutional theory has gained attention over the past decade, especially in relation to institutional isomorphism and organizational legitimacy. According to Deephouse et al. (2017), the institutional theory explains that firms based in the industry in which they exist and conduct business adopt business practices, strategies and structures that are homogenous. Particularly, the authors highlighted that institutional theory presents institutional isomorphism and organizational legitimacy dimensions. While institutional isomorphism focuses on the adoption of similar industry structures, practices and strategies in order to show conformance to acceptable norms and behaviour, organizational legitimacy bases on external stakeholders perceiving that firms adhere

to acceptable industry practices and norms, leading to good reputation, stakeholder endorsement, and social and moral capitals (Deephouse et al., 2017). In line with Tsinopoulos et al. (2018), a business's behaviour is motivated by the desire to imitate established rules and norms and, as such, specifies that the institutional theory explores the role of social influence in business practices. According to Ashworth et al. (2013), institutional isomorphism has become predominant across institutions because institutional practices and patterns are mostly driven by using rationality to achieve greater efficiency and effectiveness. Lodge and Wegrich (2005) further clarified that the predominance of industrial practice is mainly based on legitimacy and the appropriateness of the practice in that specific business environment. Additionally, the competitive nature of today's business environments has businesses aiming to gain competitive advantage, and stakeholder endorsements in addition to organizational legitimacy. As such, firms have embraced environmental practices and have been more oriented towards external norms, hence, reflecting institutional isomorphism. These orientations affect firms' strategies, decisions and practices, and thus, the integration of institutional isomorphism and organizational legitimacy can aid in explaining the factors that promote adoption of some environmental practices (in this study, sustainable logistics practices). For instance, the adoption of sustainable logistics practices in developed countries has been outstanding due to the early presence and adoption of sustainable technologies, green investors, practices and strategies. Therefore, many companies in such industries, on the basis of isomorphism, have shifted towards green practices. On the other hand, developing countries, due to late availability of sustainable technologies among others, are now picking up the pace in terms of sustainable practices, because of the motivation to attain legitimacy from stakeholder groups, improve performance and preserve the environment. Hence, firms operational in developing countries are operating in resemblance to recognized sustainable firms in their industries on the basis of institutional isomorphism and achieving organizational legitimacy. Thus, these few recognized sustainable logistics firms have shaped logistics practices in the logistics sector. Additionally, the enormous benefits that the natural resource-based view present to firms, as explained by McDougall et al. (2019), have also gained attention as motivational factors for some firms in the adoption of environmental practices. A firm's quest to achieve competitive advantage together with superior performance will motivate engagement in practices that will yield benefits like the development of capabilities and resources that are deemed rare, valuable, non-substitutable and imitable, as well as attract environmentally conscious customers, investors and suppliers among others. To conclude this section, benefits reflected by McDougall et al. (2019) under the natural resource–based view in addition to those reflected by Deephouse et al. (2017) under the institutional theory motivate firms on the adoption and implementation of sustainable business practices (sustainable logistics practices as captured in this study).

Sustainable Logistics Practices

The synergistic connection among sustainable supply chain practices, green manufacturing and sustainable logistics practices has gained significant attention, especially in the global fight for sustainability. As such, logistics and manufacturing industries have integrated sustainable initiatives into business operations in an effort to preserve the environment, attract environmentally conscious stakeholders and avoid litigations and sanctions (Baah et al., (2020). According to Baah et al. (2020), logistics companies must persistently adopt green practices that will stand the test of time; therefore, embodying the triple bottom line concept into logistics and supply chain operations may not fully solve the current global environmental crisis, although it is a step in the right direction. Moreover, according to Shashi et al. (2019), the coercive force of several political, social and economic pressures pertaining to environmental issues leaves no choice for logistics firms to operate outside the scope of being environmentally friendly. Some scholars, over the years, have studied environmental practices, especially with a manufacturing and logistics focus. Hence, this study in line with past studies elaborates sustainable logistics practices to include sustainable transportation, reverse logistics, waste management, sustainable packaging and distribution, green monitoring and evaluation, and sustainable information sharing (Baah et al., 2020; Beske et al., 2014). The above-mentioned sustainable logistics practices were adopted in this study because these practices have been coined to have a logistics focus, which suit the industry under study. The adopted logistics practices are explained as follows:

Sustainable transportation is crucial for every economy, especially the logistics sector in the effort to reduce carbon footprints. This is because this sector has been known as a robust contributor to global warming through noise pollution, air pollution and congestion. Transportation is vital for economic growth and movement of goods and services; thus, legislations and relations have been put in place to reduce negative environmental impacts and ensure strict compliance to sustainable practices in transportation (Baah et al., 2020).

Reverse logistics is very essential for managing waste in the business environment (Dias & Bragger, 2016). Reverse logistics emphasizes the reuse of materials and production components which lead to effective and efficient waste management. Dias and Bragger (2016) further explained that engaging in reverse logistics shows adherence to ecological guidelines, while significantly and efficiently greening logistics operations and refining cleaner productions.

Waste management is very critical in current business environments (Baah et al., 2020; Pujara et al., 2019). Waste management, in recent business settings, emphasizes the use or orientation towards renewable energies rather than the use of non-renewable energies in traditional manufacture. Eliminating and managing waste in the production process, as explained by Baah et al. (2020), leads to better and faster production practices, which ensure cleaner production practices and processes, which, in turn, preserve the environment.

Sustainable packaging and distribution is the very core of logistics firms and operations. According to Meherishi et al. (2019), the need for ecological packaging and distribution practices in logistics processes needs to be emphasized; thus, eco-friendly materials should be used as primary packaging materials to decrease plastic usage and carbon footprints. The obligation to eradicate plastic patronage in the production and distribution process is crucial due to the substantial health risks it poses. Sustainable packaging and distribution were combined in this study due to how connected these practices are as indicated by Colicchia et al. (2013) and also due to the fact that most of the logistics firms and service providers seemed to collectively undertake these practices.

Green monitoring and evaluation in recent years have motivated diverse checks on logistics and manufacturing sectors as highlighted by Baah et al. (2020). Furthermore, logistics firms are now seeking out for environmentally conscious manufacturing and logistics service providers in addition to supply chain partners that adhere to environmental practices by critically examining their environmental and social contributions to society (Agyabeng-Mensah et al., 2020).

Sustainable information sharing is core to maintaining environmental awareness in logistics operations. This is because through sharing of sustainable information, business and supply chain partners are updated on sustainable policies, strategies and initiatives. As a result, dissemination of sustainable information among partners of an organization, to a large extent, generates value for all partners (Huang & Wang, 2017). Having described the sustainable logistics practices adopted, we proceed to espouse the relationships and develop hypotheses between these sustainable logistics practices and environmental and financial performances, respectively.

The Relationships Among Sustainable Transportation, Environmental Reputation and Financial Performance

According to OECD (2010), the logistics sector has been a significant contributor to CO2 emissions and, as such, has attracted a lot of stakeholder pressure concerning their operations. These pressures in a way coerce logistics companies to implement green initiatives because they fear, if they do not, their firms may be legally sanctioned (Zhu & Sarkis, 2007). Sustainable transportation captures any means of transportation that embraces the green concept and, thus, has minimal impact on the environment (OECD, 2010). According to Baah et al. (2020), studies show that due to the depleting nature of the environment, more needs to be done to be able to sustain the environment for future generations. The transport sector is known as a significant contributor to environmental pollution, which negatively affects the environment. Carter and Rodgers (2008) noted that, to protect the environment for current and future generations, accepting sustainable practices must not be categorized as optional but compulsory for all. This view by some scholars has actually seen some improvement due to stakeholder awareness. Stakeholders are now making several decisions based on a firm's sustainability orientation, and as such, firms are being coerced to embody the triple bottom line into their business processes (Carter & Rodgers, 2008). Organizations that have been able to fully accept green initiatives and voluntarily do more to better society in this regard, according to Sarkis et al. (2010), have adopted a proactive approach to environmental orientation, and firms that also only undertake environmental initiatives to avoid sanctions are adopting a reactive approach. According to Toms (2002), environmental reputation comes as a result of engaging in environment-friendly practices, and since stakeholders are shifting towards environmental preservation, firms that disclose their environmental strategies to stakeholders are likely to enhance environmental reputation and eventually financial performance through widening market share and diversification (Friedman, 1970). Zailani et al. (2012) further highlighted that financial investments in sustainable initiatives, which include green transportation, may significantly drain a firm financially at the initial stages but may also yield profitable returns if managed well. Thus, the first hypothesis:

H1: Sustainable transportation positively relates to environmental performance (H1a) and financial performance (H1b).

The Relationships Among Reverse Logistics, Environmental Reputation and Financial Performance

Several studies have sought to fully understand the concept of reverse logistics, especially in the manufacturing and logistics sectors (Dias & Braga, 2016; Nagurney & Toyasaki, 2005). According to Dias and Braga (2016), reverse logistics and waste management function hand in hand in the sense that reverse logistics has been explained to involve the procedure through which organizations promote environmental friendliness by recycling,

decreasing material usage and reusing. Reverse logistics aims at reducing negative environmental impacts through management of disposable waste. In recent business settings, reverse logistics as a concept has been very beneficial to manufacturers and logistics service providers in managing electronic waste (Nagurney & Toyasaki, 2005). Reverse logistics over the years has been seen as environmentally healthy and thus attract stakeholders who are environmentally conscious to firms that undertake such practices, hence, forming collaborative networks, gaining organizational legitimacy, and attaining social and moral capitals (Baah et al., 2020; Darnell et al., 2008). Such collaborations can be lucrative and improve environmental reputation and financial performance. From the above-mentioned discussion, we propose the second hypothesis, which states:

H2: Reverse logistics is positively related to environmental performance (H2a) and financial performance (H2b).

The Relationships Among Waste Management, Environmental Reputation and Financial Performance

The persistent rise in waste, especially solid waste, has resulted in global concerns to manage these wastes in sustainable manners (Pujara et al., 2019). Over the years, the logistics sector has emerged as very vital for engaging in waste management practices like reverse logistics (Baah et al., 2020). According to Pujara et al. (2019), waste management captures the collection and treatment of waste products, which are not recyclable or reusable. The authors further explained that in recent orientation towards circular economy, waste management presents benefits that critically promote environmental reputation and the competitive position of a firm. This is because engaging in waste management practices allow sourcing of ecological raw materials and reduce waste during production process. These ensure cleaner production, which has been identified as a key factor in achieving environmental reputation, as well as improved sales, market and customer base (Dias & Braga, 2016). Pujara et al. (2019) further indicated that the focus on extended product responsibilities (EPR) also critically promotes environmental preservation because EPR shifts responsibilities (physical or financial) related to product disposal at the end of its life cycle to producers. Walls (2006) indicated that this approach aims to provide incentives for producers to deliberate environmental considerations in designing their products. Engaging in such practices according to Walls (2006) and Pujara et al. (2019) influences green reputation and the financial standing of a firm as graphically illustrated in Figure 1. From the above-mentioned discussion, we propose the third hypothesis as follows:

H3: Waste management is positively related to environmental performance (H3a) and financial performance (H3b).

The Relationships Among Sustainable Packaging and Distribution, Environmental Reputation and Financial Performance

According to Zheng and Dai (2012), sustainable packaging and distribution has gained attention as one of the core components of logistics and manufacturing operations. The focus on using ecological material in packaging products and the use of transportation means to end users

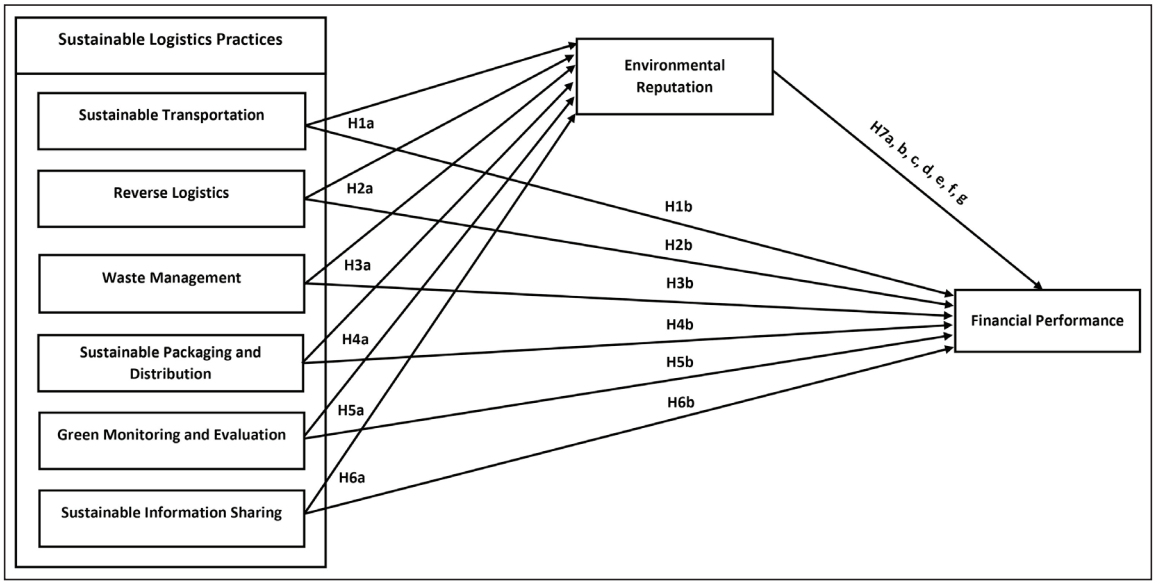

Figure 1. Structural Relationships

Source: The authors.

with lowest impact on ecological and social environment has been the basics of sustainable packaging and distribution debates (Sarkis, 2003). It can therefore be deduced that sustainable packaging and distribution is very vital to any firm that seeks to embody environmental strategies. In this current business environment, with high levels of stakeholder awareness regarding environmental initiatives, most purchase decisions depend on how well and safe a product's packaging is as well as what transport means will be used for shipment before purchase decisions are made. González-Benito and González-Benito (2006) supported this view by indicating that companies that use ecological packaging and distribution means are likely to attract green-minded customers, investors and other stakeholders, which may lead to improved environmental reputation and financial performance. Again, such investors will further push for enhanced and more efficient green initiatives, which will exert more pressure on financial capabilities of firms but can also earn more profit if such strategies are properly managed. This supports the assertion by Zailani et al. (2012) that initial green investments will drain finances but can also greatly improve finances if managed well. Thus, the fourth hypothesis is as follows:

H4: Sustainable packaging and distribution positively relates to environmental performance (H4a) and financial performance (H4b).

The Relationships Among Green Monitoring and Evaluation, Environmental Reputation and Financial Performance

Scholars and practitioners, over the years, have seen a rise in green initiatives and environmental policies in diverse industries, mostly due to pressures from several bodies both local and foreign (Eesley & Lenox, 2006). These bodies mostly referred to as stakeholders according to Baah et al. (2020) are affected by activities of companies whether internally or externally, and as such, most of these stakeholders perform monitoring and evaluation functions on activities of companies in the logistics sector to ensure compliance to green standards. In as much as stakeholders are performing these functions, Darnell et al. (2008) suggested that companies should go beyond just meeting green standards to being more proactive since it will boost collaboration and reputation with stakeholders. This suggests that firms that adopt proactive approaches to environmental friendliness should also adopt monitoring and evaluation strategies to keep them in check and improve upon their current practices. Darnell et al. (2008) supported this view by indicating that adopting monitoring and evaluation practices promote environmental learning capacity building and trust. Hoffman (2000) also asserted similar views by signifying that proactive environmental practices breed good trust relations between a firm and its stakeholders. This suggests green monitoring and evaluation impact a firm's environmental reputation, which influences financial performance and hence the fifth hypothesis:

H5: Green monitoring and evaluation positively influence environmental performance (H5a) and financial performance (H5b).

The Relationships Among Sustainable Information Sharing, Environmental Reputation and Financial Performance

Information sharing is very essential in supply chain operations; thus, to survive in the current business world, there is the need to share up-to-date information with every unit in a firm's supply chain (Huang & Wang, 2017). This is because for supply chain processes and performance to function efficiently, managers need vital information to make key supply chain decisions. According to Baah and Jin (2019), the relevance of green information sharing cannot be downplayed, and therefore, sharing sustainable information across the supply chain allows supply chain stakeholders' access to data regarding green practices and strategies. From the above, stakeholders and organizations further consider environmental management systems and certifications when dealing with other partners so as to promote environmental orientation and avoid loopholes for sanctions. Furthermore, Toms' (2002) study of UK firms indicated that disclosure and sharing of sustainable information with stakeholders really improved stakeholder acceptance of such firms and influenced environmental reputation. This connotes that sharing information with stakeholders allows a more open collaboration, thereby enhancing trust as supported by Hassan and Nasereddin (2018). According to Hassan and Nasereddin (2018), information sharing with stakeholders or across a supply chain helps in achieving accurate management and efficiency between stakeholders and supply chain partners. Thus, the sixth hypothesis is as follows:

H6: Sustainable information sharing positively influences environmental performance (H6a) and financial performance (H6b).

The Relationships Between Environmental Performance and Financial Performance

Despite the increasing pressures to adopt green practices, some shareholders are motivated not to accept such initiatives because adoption of environmental practices mean increase in financial obligations, which may not be favourable for shareholders (Walley & Whitehead, 1994). Although, the earlier assertion by Walley & Whitehead (1994) is true to some extent that adopting green initiatives will come with great financial demands, it can also be a source of great returns if managed well (Friedman, 1970).

Bansal and Roth (2000) asserted that to fully embrace green initiatives requires technology, human expertise and other resources, which are expensive to acquire and thus deter some firms from adopting environmental practices. Toms (2002) supported Bansal and Roth's (2000) view but went further to indicate that more gains can be derived from environmental reputation, which originates from undertaking environmental initiatives. This assertion by Toms (2002) motivates firms to consider improving environmental reputation through disclosing environmental practices to their stakeholders since that boosts financial performance. From the above, it can be inferred that sustainable logistics practices influence environmental reputation and financial performance. Therefore, it is important to assess the mediating role of environmental reputation in the relationships between sustainable transportation, reverse logistics, waste management, sustainable packaging and distribution, green monitoring and evaluation, and sustainable information sharing and financial performance as well. Thus, the seventh hypothesis states:

H7: Environmental reputation positively influences financial performance (H7a) and mediates sustainable transportation–financial performance (H7b), reverse logistics–financial performance (H7c), waste management–financial performance (H7d), sustainable packaging and distribution–financial performance, green monitoring and evaluation–financial performance (H7e) and sustainable information sharing–financial performance (H7f) relationships.

Methodology

Data Collection and Common Method Bias

The quantitative approach was adopted because the study sought to establish the effect of sustainable logistics practices on environmental reputation and financial performance, while also studying the mediating role of environmental reputation between these sustainable logistics practices and financial performance. The study focused on logistics firms operational in the Ghanaian setting; most of these firms were small and medium-sized enterprises. The data used in the study were from information solicited using questionnaires that were formed based on review of literature, which also focused on similar or related constructs adopted in this study. A total of 130 questionnaires were sent out to be answered by managers who had first-hand information regarding strategies involving sustainable or green initiatives being implemented by their respective firms. Out of the 130 questionnaires sent out, we received 115 questionnaires back, and as such, these questionnaires were used in the data analysis procedure using structural equation modelling (SEM) technique and SmartPLS software to be specific.

Additionally, the questionnaires were developed, following the guidelines stipulated by Podsakoff et al. (2003), to curb issues of common method bias (CMB). Particularly, the questionnaires assured privacy to respondents, acquired measures from diverse sources and had well-separated sections of measured items. To further deal with issues of CMB associated with survey design, we assessed CMB using Harman's one-factor test. Analysis using exploratory factor analysis (EFA) and the principal component analysis extraction method procedure specified that this study is free from CMB since the single factor explained 38.4% of the cumulative variance which is below the threshold of 50%.

Measurement Items' Description

The developed questionnaire contained 35 questions for reflecting sustainable logistics practices, environmental reputation and financial performance. These measuring items were adapted from the works of Sarkis et al. (2010), De Souza et al. (2018), Lai and Wong (2012), Pujara et al. (2019) and Colicchia et al. (2013) for sustainable logistics practices, Yusoff et al. (2018) and Kim and Lee (2012) for environmental performance and Li et al. (2017) and Santis et al. (2016) for financial performance. Although there were 35 items under study, those items that loaded below 0.70 were removed from their assigned constructs to enhance model strength (Hair et al., 2013). The constructs in this study were modelled reflectively, and thus, the deletion of items that loaded <0.70 should pose no issues for the structural model. The items deleted from the model have been marked with * in Appendix 1.

Analysing results in SEM requires the appraisal of the model's strength, which is mostly undertaken by examining the model's reliability (using Cronbach's alpha and composite reliability) and convergent and discriminant validities (using average variance extracted [AVE] and Fornell–Lacker criterion). According to Henseler et al. (2015), Cronbach's alpha and composite reliability should be ≥0.70, while the AVE should be >0.50. In assessing validity of the constructs, AVEs were first considered followed by Fornell–Lacker criterion.

Assessment of Structural Model

The study employed the partial least square structural equation modelling (PLS-SEM) method in estimating our structural model, thus demanding the scrutiny of the measurement model through constructs' validity and reliability checks (Hair et al., 2013). Table 1 shows that the model achieves reliability since the Cronbach's alpha and composite reliability ranged between 0.720–0.814 and 0.813–0.890, respectively, hence, connoting high reliability of constructs. Convergent validity indicates how a set of indicators portraying unidimensionality is supposed to represent their underlying construct (Henseler et al., 2015). According to past studies that used PLS-SEM technique

Table 1. Construct Validity and Reliability

Construct	Factor Loadings	Collinearity Statistics (VIF)	Cronbach Alpha	Composite Reliability	Average Variance Extracted (AVE)
Environmental reputation			0.814	0.890	0.729
ER1	0.838	1.831			
ER2	0.875	2.024			
ER4	0.848	1.657			
Financial performance			0.782	0.860	0.607
FP1	0.827	2.761			
FP2	0.710	1.407			
FP4	0.749	1.530			
FP5	0.823	2.801			
Green monitoring and evaluation			0.778	0.813	0.594
GME1	0.703	1.234			
GME4	0.867	1.409			
GME5	0.733	1.296			
RL			0.720	0.813	0.687
RL1	0.846	1.353			
RL2	0.876	1.834			
RL3	0.759	2.028			
Sustainable information sharing			0.741	0.852	0.658
SIS2	0.788	1.350			
SIS3	0.816	1.656			
SIS4	0.828	1.544			
Sustainable packaging and distribution			0.721	0.843	0.644
SPD1	0.857	1.632			
SPD2	0.830	1.640			
SPD3	0.712	1.242			
Sustainable transportation			0.757	0.842	0.571
ST2	0.777	1.847			
ST3	0.759	1.633			
ST4	0.709	1.457			
ST5	0.776	1.264			
Waste management			0.783	0.874	0.699
WM2	0.729	1.415			
WM3	0.873	1.977			
WM4	0.896	2.363			

Source: The authors.

(Hair et al., 2013), items or indicators with low factor loadings below the recommended threshold should be removed since it enhances the model's direct path strengths, upgrades AVE and enhances the model's constructs' interactions. Table 1 signifies that the AVEs of the constructs ranged between 0.571 and 0.729, depicting the convergent validity of the constructs, since all AVEs were higher than the threshold of 0.5. Additionally, to ensure the model is free from issues of multicollinearity, outer and inner variance inflation factors (VIFs) were scrutinized and reported in Tables 1 and 4, respectively. The examination of collinearity statistics indicated that the model has no issues of multicollinearity, and all items had both outer and inner VIFs < 3, thus posing no multicollinearity threats.

Assessing Discriminant Validity

Furthermore, we assessed discriminant validity using Fornell–Lacker criterion presented in Table 2. Tables 2 shows the square roots of AVEs and its correlations with latent variables in the study. The Fornell–Lacker criterion asserts that the square roots of the AVEs on a construct should be higher than its correlations with other constructs in the model. Thus, Table 2 implies the attainment of discriminant validity.

Results and Discussions

Table 3 shows R^2, the adjusted R^2, Q^2 and direct path beta (β) coefficients in the structural model. The R^2 illustrates the variation of the dependent variable predicted by the independent variables, and Q^2 measures predictive relevance by analysing each construct's predictive relevance through the omission of selected inner model interactions and then calculates changes in the criteria estimates (Hair et al., 2013). From Table 3 and Figure 2, the structural model explains 0.743 of the variance of financial performance and 0.828 of the variance of environmental reputation. Moreover, the adjusted R^2 values were 0.726 and 0.819, respectively, and the blindfolding

Table 2. Fornell–Lacker Criterion

Construct	1	2	3	4	5	6	7	8
1. Environmental reputation	**0.874**							
2. Financial performance	0.738	**0.779**						
3. Green monitoring and evaluation	0.524	0.461	**0.771**					
4. Reverse logistics	0.852	0.759	0.481	**0.829**				
5. Sustainable information sharing	0.728	0.564	0.625	0.643	**0.811**			
6. Sustainable Packaging and distribution	0.616	0.467	0.744	0.542	0.611	**0.802**		
7. Sustainable transportation	0.663	0.658	0.539	0.580	0.635	0.396	**0.756**	
8. Waste management	0.603	0.663	0.501	0.609	0.678	0.442	0.561	**0.836**

Source: The authors.

procedure indicated that environmental reputation and financial performance have predictive relevance since their Q^2 values were 0.463 and 0.376, respectively. From Table 3, it can be ascertained that sustainable transportation, reverse logistics, waste management, sustainable packaging and distribution, green monitoring and evaluation, and sustainable information sharing collectively explained 74.3% and 82.8% of the variances of financial performance and environmental reputation, respectively.

The analysis and interpretation of the data as presented in Table 3 and Figure 2 show that Hypothesis 1a, which connotes that sustainable transportation positively relates to environmental reputation (β = 0.238, T = 3.728, p = 0.000), and 1b, which states sustainable transportation positively relates to financial performance (β = 0.173, T = 2.175, p = 0.030), were both supported. These findings are supported, in that sustainable transport practices critically boost a firm's environmental reputation and financial performance. In line with the findings of Baah et al. (2020), green logistics practices, which reflect sustainable transportation, are very critical for reducing carbon footprints as well as other negative environmental impacts. These sustainable transportation practices project conformance to current industry stakeholder demands, hence, leading to good reputation and among other stakeholder endorsement. Financial performance is also improved because green initiatives, as explained by Colicchia et al. (2013), attract environmentally conscious investors, customers and suppliers, among others, which boost market share, sales and profit margins.

Again, Hypothesis 2a, which establishes that reverse logistics positively influences environmental reputation (β = 0.550, T = 6.020, p = 0.000), and 2b, which states reverse logistics positively relates to financial performance (β = 0.161, T = 1.339, p = 0.181), were both supported as well. These findings are in line with the assertion by Lai and Wong (2012) that the adoption of green or environmental practices significantly affects environmental reputation and financial performance if the right strategies and policies are implemented. Specifically, reverse logistics in addition to waste management has gained serious attention, especially in the logistics and manufacturing sectors due to their crucial nature in reducing negative environmental impacts. Reverse logistics promises better handling of outdated products as well as the efficient reuse and patronage of waste management practices. These reverse logistics practices promote corporate environmental reputation, which also eventually translates into increased financial performance.

Additionally, Hypothesis 3a, which aimed at establishing the positive influence of waste management on environmental reputation (β = 0.033, T = 0.577, p = 0.564), and Hypothesis 3b, which also emphasized the positive influence of waste management on financial performance (β = 0.279, T = 3.487, p = 0.000) were both supported. The relevance of waste management practices in current production practices, especially in manufacturing and logistics sectors, have become paramount. As explained by Baah et al. (2020), encouraging cleaner production practices, which reduces waste and promotes the use of renewable energy sources as well as raw materials, improve sustainability of firms and, thus, ensure preservation of the environment. Cleaner productions also critically improve environmental reputation and attract key stakeholders, which enlarge market share, eventually resulting in higher sales and financial performance.

Furthermore, Hypothesis 4a, which connotes that sustainable packaging and distribution positively influences environmental reputation (β = 0.197, T = 2.880, p = 0.004), was supported, while Hypothesis 4b, which aimed at the impact of sustainable packaging and distribution on financial performance (β = –0.013, T = 0.142, p = 0.887), was not supported. As indicated by Meherishi et al. (2019), sustainable packaging and distribution is very vital for both manufacturing and logistics firms. Importantly, stakeholder groups' demand on firms to be eco-friendlier and ecological with regard to packaging and distribution practices indicates that firms will achieve environmental reputation, which will also lead to improved financial performance if properly managed. According to Baah et al. (2020), initial investment in green practices, including sustainable packaging and distribution, may pose negative impacts on financial performance due to the costly nature of investments, thus supporting the negative influence on financial performance (Hypothesis 4b). In addition, engaging in sustainable packaging and distribution will

eventually begin to generate gains which may not be significant but will in the long run be very beneficial for firms.

Hypothesis 5a, which sought to establish that green monitoring and evaluation positively related to environmental reputation (β = −0.168, T = 2.702, p = 0.007), was not supported, while Hypothesis 5b, which aimed at establishing the positive effect of green monitoring and evaluation on financial performance (β = 0.035, T = 0.354, p = 0.724), was supported. These findings indicate that green monitoring and evaluation strategies may initially yield no gain for environmental reputation but, in long run, may yield great financial returns, as suggested by Zailani et al. (2012). This may be so because stakeholders have already performed this particular function of monitoring and evaluation; thus, stakeholders may not notice such initiatives undertaken by logistics companies. Additionally, green monitoring and evaluation practices in the adoption stages will present investments that will project some financial strains on the firm, but if green monitoring and evaluation practices are well managed, it will become a source of competitive advantage. Green monitoring and evaluation are negatively related to environmental reputation because, in the Ghanaian logistics sector, few logistics firms are involved in disclosing environmental monitoring and evaluation practices. According to Toms (2002), the inability to disclose these vital green monitoring and evaluation practices indicates to stakeholders that such practices may not exist, and that they are likely the ones to engage in such practices, and hence negatively affecting environmental reputation of firms that do not engage in disclosure of green monitoring and evaluation practices.

Analysis and study of data, as presented in Table 3, show that Hypothesis 6a, which sought to establish the positive influence of sustainable information sharing on environmental reputation (β = 0.192, T = 2.584, p = 0.010), was supported, while 6b, which also sought to establish positive relationship between sustainable information sharing and financial performance (β = −0.257, T = 2.450, p = 0.014), was not supported. As explained by Huang and Wang (2017), sustainable information sharing is very vital, since it allows the dissemination of information in relation to environmental initiatives, policies and strategies. Firms that engage in sustainable information sharing with diverse stakeholders will robustly and significantly boost environmental reputation. Although boosting environmental reputation will lead to enhanced financial performance, sustainable information sharing does not promise improved financial performance on its own but, through environmental reputation, can boost financial performance.

Finally, Hypothesis 7a, which states environmental reputation positively influences financial performance (β = 0.562, T = 4.433, p = 0.000), was supported. Toms (2002) supported this finding by suggesting that firms can improve environmental reputation by making disclosures about the adoption and enforcement of sustainable practices. Thus, adopting sustainable logistics practices will likely improve environmental reputation and financial performance as suggested by Lin and Ho (2011). The authors supported the above-mentioned claim by showing that the adoption of green practices enormously influences environmental reputation and financial performance in the initial adoption stages and specifically improves financial performance

Table 3. Structural Model

Construct	R^2	Adjusted R^2	Q^2
ER	0.828	0.819	0.463
FP	0.743	0.726	0.376

Path	Beta Coefficient (β)	Standard Deviation	T-statistics	p-Values	Hypotheses	Inner VIF
ST → ER	0.238	0.064	3.728	0.000	1a: Supported	2.047
ST → FP	0.173	0.080	2.175	0.030	1b: Supported	2.378
RL → ER	0.550	0.091	6.020	0.000	2a: Supported	2.165
RL → FP	0.161	0.120	1.339	0.181	2b: Supported	2.929
WM → ER	0.033	0.058	0.577	0.564	3a: Supported	2.129
WM → FP	0.279	0.080	3.487	0.000	3b: Supported	2.135
SPD → ER	0.197	0.068	2.880	0.004	4a: Supported	2.709
SPD → FP	−0.013	0.089	0.142	0.887	4b: Not supported	2.934
GME → ER	−0.168	0.062	2.702	0.007	5a: Not supported	2.775
GME → FP	0.035	0.098	0.354	0.724	5b: Supported	2.938
SIS → ER	0.192	0.074	2.584	0.010	6a: Supported	2.909
SIS → FP	−0.257	0.105	2.450	0.014	6b: Not supported	2.892
ER → FP	0.562	0.127	4.433	0.000	7a: Supported	2.944

Source: The authors.

Note: ER—Environmental reputation; FP—financial performance; ST—sustainable transportation; RL—reverse logistics; WM—waste management; SPD—sustainable packaging and distribution; GME—green monitoring and evaluation; and SIS—sustainable information sharing.

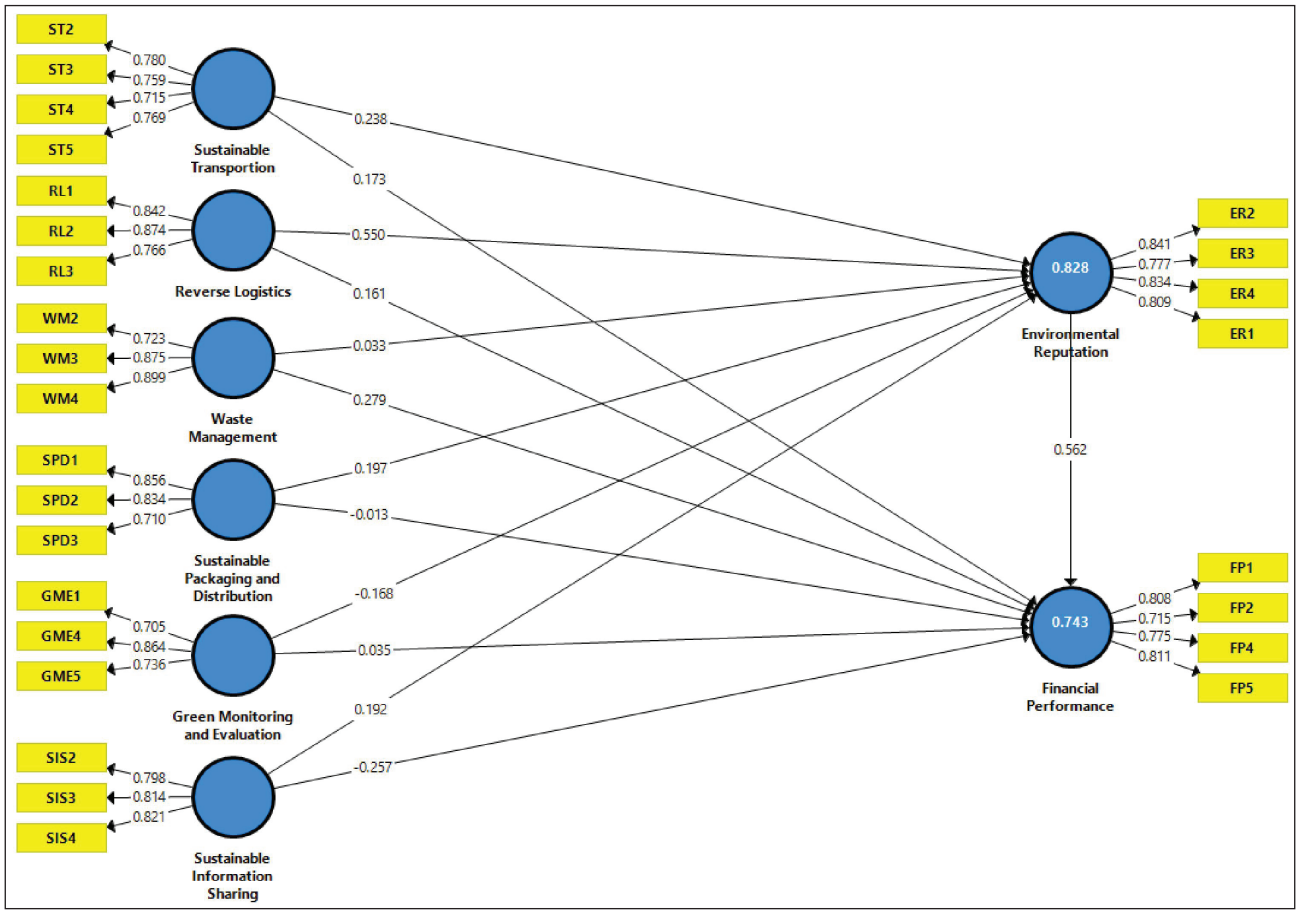

Figure 2. Structural Model Showing Path Coefficients (β) and R^2

Source: The authors.

through attracting customers, suppliers, investors and other environmentally conscious stakeholders.

Mediation Effect

As presented in Table 4, analysis of the data concerning mediation showed that environmental reputation had a complementary partial mediation effect on the relationship between sustainable transportation and financial performance because both direct effects ($\beta = 0.173$, $T = 2.175$, $p = 0.030$) and indirect effects of environmental reputation ($\beta = 0.134$, $T = 2.653$, $p = 0.008$) are significant with both path coefficients being positive. Thus, Hypothesis 7b was supported. Again, Hypothesis 7c was supported since the relationship between reverse logistics and financial performance indicated a full mediation as the direct effect of reverse logistics on financial performance was insignificant ($\beta = 0.161$, $T = 1.339$, $p = 0.181$), and the indirect effect through environmental reputation ($\beta = 0.309$, $T = 3.086$, $p = 0.002$) was significant. This means that environmental reputation is key to logistics firms that undertake reverse logistics in the sense that such practices will enhance financial performance. Moreover, Hypothesis 7d, which posited that environmental reputation mediated the relationship between waste management and financial performance, was not supported. The results presented no mediation because the direct effect ($\beta = 0.279$, $T = 3.487$, $p = 0.000$) was significant, while the indirect effect through environmental reputation ($\beta = 0.019$, $T = 0.0597$, $p = 0.551$) was found to be insignificant. Furthermore, environmental reputation had a full mediation effect on sustainable packaging and distribution and financial performance relationship because the analysis indicated that the direct effect was insignificant ($\beta = -0.013$, $T = 0.142$, $p = 0.887$), but the indirect effect of environmental reputation was significant ($\beta = 0.110$, $T = 2.549$, $p = 0.011$), thus, establishing the case of a full mediation and supporting Hypothesis 7e. Hypothesis 7f was also supported by the study, indicating an indirect only mediation, which signifies a full mediation, because the direct effect of green monitoring and evaluation on financial performance ($\beta = 0.031$, $T = 0.354$, $p = 0.724$) was insignificant but that of the indirect effect through environmental reputation ($\beta = -0.094$, $T = 2.219$, $p = 0.027$) was significant. Finally, environmental reputation's indirect effect on the sustainable information sharing and financial performance relationship

Table 4. Specific Indirect Mediation

Path	Beta Coefficient (β)	Standard Deviation	*T*-statistics (|O/STDEV|)	*p*-Values	Hypotheses
ST → ER → FP**	0.134	0.050	2.653	0.008	7b: Supported
RL → ER → FP***	0.309	0.100	3.086	0.002	7c: Supported
WM → ER → FP*	0.019	0.031	0.597	0.551	7d: Not supported
SPD → ER → FP***	0.110	0.043	2.549	0.011	7e: Supported
GME → ER → FP***	−0.094	0.042	2.219	0.027	7f: Supported
SIS → ER → FP****	0.108	0.044	2.421	0.016	7g: Supported

Source: The authors.
Note: *: No mediation; **: complementary mediation; ***: full mediation; and ****: competitive mediation.

showed a competitive partial mediation effect because the direct and indirect effects through environmental reputation between sustainable information sharing and financial performance ($\beta = -0.257$, $T = 2.450$, $p = 0.014$) were both significant, but β coefficients moved in opposite directions, thus supporting Hypothesis 7g.

Conclusion and Implications

Concerns about preserving the environment are vital issues for industries worldwide. This study concentrated on logistics firms due to less research focus on the service sector; thus, the study focused on how sustainable logistics practices, specifically sustainable transportation, reverse logistics, waste management, sustainable packaging and distribution, green monitoring and evaluation, and sustainable information sharing, influence an organization's environmental reputation and financial performance. The study revealed key findings that may be crucial to logistics managers in their task to preserve the environment as well as achieve organizational objectives. The study results indicated that sustainable logistics practices are key to attaining environmental reputation, improving financial performance, and help shape operations towards environmental friendliness. Moreover, analysis and scrutiny of the data showed that sustainable transportation, reverse logistics, waste management, sustainable packaging and distribution, green monitoring and evaluation, and sustainable information sharing largely promoted and significantly contributed to achieving environmental reputation, which largely and significantly improves financial performance. This shows that logistics managers should positively align to accepting sustainable practices, since they contribute to environmental reputation, which also significantly affect financial performance of an organization. Furthermore, the results indicated that environmental reputation played an indirect role by portraying that the influence of sustainable transportation, reverse logistics, waste management, sustainable packaging and distribution, green monitoring and evaluation, and sustainable information sharing on financial performance is not only direct but also influenced through their environmental reputation. The results showed that environmental reputation had a partial complementary mediation between sustainable transportation and financial performance. Again, environmental reputation had a full mediation on the relationships among reverse logistics, sustainable packaging and distribution, green monitoring and evaluation, and financial performance, while having no mediation between waste management and financial performance. Environmental reputation had a partial competitive mediation on the relationship between sustainable information sharing and financial performance. This suggests that managers should encourage those practices, which boost the acquisition of environmental reputation, since it has an indirect influence on the relationships among sustainable transportation, reverse logistics, sustainable packaging and distribution, green monitoring and evaluation, and sustainable information sharing and financial performance.

Also, this study seeks to contribute to the current literature by helping to understand sustainable logistics practices in a global perspective since several studies on the subject have been conducted in developed countries with less emphasis on developing countries. From the above-mentioned findings and conclusions, adopting and implementing sustainable logistics practices as an organization is very necessary for smooth operations. Regardless of the nature of business operation or objectives, there are always opportunities to strengthen and enhance sustainable practices in the organization, and as such, it is recommended that managers should collaboratively work with stakeholders to better achieve sustainable objectives.

Theoretical Implications

The study assessed the relationships among sustainable logistics practices, environmental reputation and financial performance. Basing on the study goals, we first explored the need to be environmentally sustainable. Specifically, the study espoused the motivations for the adoption of sustainable logistics practices from an institutional theory and natural resource–based view perspectives. The institutional theory was explained from the perspectives of institutional isomorphism and organizational legitimacy. From both perspectives, the study results show that firms in the logistics sector have shifted towards the adoption and implementation of sustainable logistics practices due to the fact that sustainable operational practices are

currently seen as the right and acceptable behaviour or norms. Hence, firms in their quest to promote stakeholder endorsement leading to organizational legitimacy align themselves with such practices, which reflect institutional isomorphism. Additionally, based on the benefits that also arrive from the natural resource–based view, several firms in their quest to promote superior competitive advantage and performance have engaged in practices that protect the natural environment, enhance good stakeholder perception and endorsement.

Practical Implications

The study provides relevant knowledge on sustainable logistics practices that can further improve current environmental practices and initiatives. The increasing need to reduce carbon footprints and reduce waste to portray environmental values and awareness, especially in the logistics sector, is highly important today where logistics is integrated into business activities. Seeing the spreading nature of logistics operations, policymakers through policies and subsidies can aid companies to adopt and implement sustainable logistics practices. These steps boost cleaner production practices, promote environmental innovations, ensure sustainable packaging and product recycling, among other, which will eventually lead to safer consumer products and healthier environments. Again, leaders of logistics firms can seek joint collaborations and support from green-sensitive stakeholders in the firm's quest to improve sustainable logistics practices. Finally, understanding and executing best sustainable logistics practices will enable firms to increase delivery efficiency, reduce cost, minimize raw material wastage and augment cleaner production practices, eventually, resulting in increased productivity and better adherence to legislations.

Limitations and Further Research

Despite the fact that the study results indicated environmental reputation as a key mediating variable among sustainable transportation, reverse logistics, waste management, sustainable packaging and distribution, green monitoring and evaluation, and sustainable information sharing and financial performance, there are some shortfalls of the study. The study modelled environmental reputation as the only mediating variable; further, researches can consider other variables since there may be others that mediate these relationships. Moreover, the single-country limitation establishes that the results of the study can only be explained in the Ghanaian setting, and thus the study results cannot be generalized. In addition, the procedure and findings of this study can be restructured and implemented in other industries because green initiatives are now required of most firms. The study randomly selected logistics firms that were operational and, as such, could not consider all logistics companies operating in the country, based on reachability and other constraints. Finally, this study relied on five key sustainable logistics practices, namely sustainable transportation, reverse logistics, waste management, sustainable packaging and distribution, green monitoring and evaluation, and sustainable information sharing, which were selected to suit the sector under study and establish their influence on environmental reputation and financial performance; thus, further studies can then consider more sustainable practices to provide a much more comprehensive view on sustainable logistics practices.

Declaration of Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding

The authors received no financial support for the research, authorship and/or publication of this article.

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Appendix 1. Measurement Items

Construct	Item	Measurement Item	Mean	Standard Deviation	Source
Sustainable transport (ST)	*ST1**	*Adopting and implementing new energy sources to replace the use of fossil fuels*			
	ST2	Promotes the reduction of driving time to minimize congestion, oil usage and pollution	4.200	0.760	De Souza et al. (2018) and Dubey et al. (2015)
	ST3	Regularly engages in vehicle maintenance to reduce carbon footprints	4.017	0.832	
	ST4	Improves travel routes and schedules to reduce transport distance and time	4.357	0.826	
	ST5	Encourages sharing of traffic information to ensure transparency with stakeholders	4.113	0.842	
Reverse logistics (RL)	RL1	Collects unwanted or used products for remanufacturing, thus ensuring quality	4.316	0.892	
	RL2	Retrieves used packaging for reuse or recycling	4.088	0.879	Lai and Wong (2012), Khan et al. (2017) and Govindan and Soleimani (2017)
	RL3	Improves ecological material usage to reduce waste	4.035	0.837	
	*RL4**	*Retrieves used or unwanted products for waste management purposes*			
	*RL5**	*Improves quality and timeliness of e-work and repair*			
Waste management (WM)	*WM1**	*Source reusable production materials*			Pujara et al. (2019), Walls (2006) and Guerrero et al. (2013)
	WM2	Engages in reverse logistics to increase waste reuse	3.789	0.869	
	WM3	Engages in waste reduction campaigns	4.149	0.957	
	WM4	Available facilities for solid waste collection and processing	3.886	0.925	
	*WM5**	*Suitability of infrastructure to manage waste*			
Sustainable packaging and distribution (SPD)	SPD1	Reduces product waste	3.748	0.912	
	SPD2	Improves distribution and logistics efficiency	3.591	0.941	
	SPD3	Increases the use of ecological materials	3.174	0.932	Atmaca and Çalgüner (2018) and Gustavo et al. (2017)
	*SPD4**	*Reduces toxicity and litter impacts of packaging materials*			
	*SPD5**	*Minimizes distribution time through efficient routing systems*			
Green monitoring and evaluation (GME)	GME1	Promotes monitoring and the dissemination of information related to sustainable practices	3.130	0.985	Lai and Wong (2012) and Colicchia et al. (2013)
	*GME2**	*Green performance is periodically captured*			
	*GME3**	*Ensures visibility in annual reports on green monitoring*			
	GME4	Measures are in place to track sustainable logistics practices and improve such practices from time to time	3.774	0.933	
	GME5	Sustainable logistics practices are periodically reported and assessed	3.304	0.934	
Sustainable information sharing (SIS)	*SIS1**	*Promotes disclosure of relevant information with all stakeholders*			
	SIS2	Ensures sharing of valuable knowledge with partners	3.965	0.884	
	SIS3	Promotes joint sharing and usage of green obtained from environmental assessment	3.765	0.873	Kaipia et al. (2017) and de Camargo Fiorini and Jabbour (2017)
	SIS4	Encourages the exchange timely green information with supply chain partners and other stakeholders	3.896	0.888	
	*SIS5**	*Ensures sharing of green know-how and expertise information with key stakeholders*			

Environmental reputation (ER)	ER1	Research and disclosure of environmental issues	4.261	0.803	
	ER2	Encourages stakeholders involvement in planning and executing environmental practices	4.357	0.826	Kim and Lee (2012) and Shashi et al. (2019)
	ER3	Allows environmental audits	4.079	0.956	
	ER4	Adoption of cleaner production methods	4.130	0.928	
	*ER5**	*Responsive to environmental guidelines from all stakeholder groups*			
Financial performance (FP)	FP1	Return on equity	3.988	0.978	
	FP2	Return on sales	4.139	0.959	Li et al. (2017) and Santis et al. (2016)
	*FP3**	*Return on investment*			
	FP4	Profit margin	4.191	0.874	
	FP5	Net profit	3.835	0.977	

Note: Items marked with * were deleted from the model due to low factor loadings.

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